

CLAIM AMENDMENTS

1 1. (Original) A method of determining a Layer 2 path between a source device and a
2 destination device in a switched network, the method comprising the
3 computer-implemented steps of:
4 determining a Layer 3 path between the source device and the destination device,
5 wherein the Layer 3 path comprises information identifying two or more Layer
6 3 devices;
7 determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
8 and
9 concatenating the subpaths to result in creating and storing information representing
10 the Layer 2 path.

AB 1 2. (Original) The method as recited in Claim 1, wherein determining a subpath for each
2 contiguous pair of Layer 3 devices comprises the steps of:
3 determining a first interface on a first node of the contiguous pair that is connected to
4 a second interface on a second node of the contiguous pair for a given subnet;
5 and
6 selecting a relevant VLAN between the first and second nodes of the contiguous pair
7 based on the first and second interfaces; and
8 gathering current spanning tree information for the relevant VLAN.

1 3. (Currently Amended) The method as recited in Claim 2, wherein selecting a relevant
2 VLAN between the first and second nodes of the contiguous pair comprises the steps
3 of:
4 selecting a matching native VLAN of the first and second nodes of the contiguous pair
5 as the relevant VLAN when the first interface and the second interface of the
6 first and second nodes respectively of the contiguous pair are non-VLAN
7 trunking interfaces;

8 selecting a matching active VLAN that is designated to carry traffic to a next hop as
9 the relevant VLAN when the first interface and the second interface of the first
10 and second nodes respectively of the contiguous pair are VLAN trunking
11 interfaces; and
12 selecting a native VLAN that is on a non-VLAN trunking interface as the relevant
13 VLAN when one of the first and second nodes of the contiguous pair has the
14 non-VLAN trunking interface.

1 4. (Currently Amended) The method as recited in Claim 1, wherein determining a
2 subpath for each contiguous pair of Layer 3 devices further comprises the steps of:
3 tracing a first path segment from a first node of the contiguous pair by following a
4 spanning tree associated with a relevant VLAN for the contiguous pair to a
5 root of the spanning tree;
6 tracing a second path segment from a second node of the contiguous pair by following
7 the spanning tree associated with the relevant VLAN for the contiguous pair to
8 the root of the spanning tree; and
9 concatenating the first and second path segments to result in creating and storing the
10 subpath for the contiguous pair.

1 5. (Original) The method as recited in Claim 4, wherein concatenating the first path
2 segment and the second path segment to result in creating and storing the subpath for
3 the contiguous pair includes the step of eliminating extraneous devices from the first
4 and second path segments.

1 6. (Original) The method as recited in Claim 1, wherein concatenating the subpaths to
2 result in creating and storing information representing the Layer 2 path includes the
3 step of eliminating extraneous devices from the subpaths.

1 7. (Original) A method of determining a Layer 2 path between a source device and a
2 destination device in a switched network, the method comprising the computer-
3 implemented steps of:

determining a Layer 3 path between the source device and the destination device,
wherein the Layer 3 path comprises information identifying two or more Layer
3 devices;
identifying contiguous pairs of Layer 3 devices in the Layer 3 path;
determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
determining whether any contiguous pair of Layer 3 devices has no subpath;
concluding that there is no Layer 2 path when any contiguous pair of Layer 3 devices
has no subpath;
eliminating extraneous devices in the subpaths; and
concatenating the subpaths to result in creating and storing information representing
the Layer 2 path when each of the contiguous pairs of Layer 3 devices has a
subpath.

8. ~~(Currently Amended)~~ The method as recited in Claim 7, wherein determining a
subpath for each contiguous pair of Layer 3 devices comprises the steps of:
determining a first interface on a first node of the contiguous pair that is connected to
a second interface on a second node of the contiguous pair for a given subnet
when both the first node of the contiguous pair and the second node of the
contiguous pair have non-trunking interfaces;
determining a first native VLAN of the first interface and a second native VLAN the
second interface;
determining whether the first native VLAN matches the second native VLAN;
selecting the matching VLAN as a relevant VLAN between the first and second nodes
of the contiguous pair when the first native VLAN matches the second native
VLAN;
gathering a current spanning tree information for the relevant VLAN;
tracing a first path segment from the first node of the contiguous pair to a root of the
spanning tree by following the current spanning tree information associated
with the relevant VLAN to ~~[[a]]~~ the root of the spanning tree;
tracing a second path segment from the second node of the contiguous pair to the root
of the spanning tree by following the current spanning tree information
associated with the relevant VLAN;

eliminating extraneous devices in the first and second path segments; and
concatenating the first path segment and the second path segment to result in creating
and storing the subpath for the contiguous pair.

9. (Currently Amended) The method as recited in Claim 7, wherein determining a
subpath for each contiguous pair of Layer 3 devices comprises the steps of:
determining a non-trunking node of the contiguous pair when one of the nodes of the
contiguous pair for a given subnet has a non-trunking interface and the other
node of the contiguous pair has a trunking interface;
determining the non-trunking interface on the non-trunking node of the contiguous
pair as a first interface that is connected to a second interface on the other node
of the contiguous pair;
determining a native VLAN on the first interface;
determining whether there is an active VLAN on the second interface that matches the
native VLAN on the first interface;
selecting the matching VLAN as a relevant VLAN between the non-trunking node and
the other node of the contiguous pair when there is an active VLAN on the
second interface that matches the native VLAN on the first interface;
gathering a current spanning tree information for the relevant VLAN;
tracing a first path segment from the non-trunking node of the contiguous pair to a root
of the spanning tree by following the current spanning tree information
associated with the relevant VLAN to the root of the spanning tree;
tracing a second path segment from the other node of the contiguous pair to the root of
the spanning tree by following the current spanning tree information associated
with the relevant VLAN;
eliminating extraneous devices in the first and second path segments; and
concatenating the first path segment and the second path segment to result in creating
and storing the subpath for the contiguous pair.

10. (Currently Amended) The method as recited in Claim 7, wherein determining a
subpath for each contiguous pair of Layer 3 devices comprises the steps of:

3 determining a first interface on a first node of the contiguous pair that is connected to
4 a second interface on a second node of the contiguous pair for a given subnet
5 when both the first node of the contiguous pair and the second node of the
6 contiguous pair have non-trunking interfaces; and
7 determining a first active VLAN of the first interface associated with the given subnet
8 and a second active VLAN the second interface associated with the given
9 subnet;
10 determining whether the first active VLAN matches the second active VLAN;
11 selecting the matching VLAN as a relevant VLAN between the first and second nodes
12 of the contiguous pair when the first active VLAN matches the second active
13 VLAN;
14 gathering a current spanning tree information for the relevant VLAN;
15 tracing a first path segment from the first node of the contiguous pair to a root of the
16 spanning tree by following the current spanning tree information associated
17 with the relevant VLAN to ~~[[a]]~~ the root of the spanning tree;
18 tracing a second path segment from the second node of the contiguous pair to the root
19 of the spanning tree by following the current spanning tree information
20 associated with the relevant VLAN;
21 eliminating extraneous devices in the first and second path segments; and
22 concatenating the first path segment and the second path segment to result in creating
23 and storing the subpath for the contiguous pair.

- 1 11. (Currently Amended) A computer-readable medium carrying one or more sequences
2 of one or more instructions for determining a Layer 2 path between a source ~~node~~
3 device and a destination ~~node~~ device in a switched network, the one or more
4 sequences of one or more instructions including instructions which, when executed by
5 one or more processors, cause the one or more processors to perform the steps of:
6 determining a Layer 3 path between the source device and the destination device,
7 wherein the Layer 3 path comprises information identifying two or more Layer
8 3 devices;
9 determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
10 and

concatenating the subpaths to result in creating and storing information representing the Layer 2 path.

12. (Original) The computer-readable medium as recited in Claim 11, wherein determining a subpath for each contiguous pair of Layer 3 devices comprises the steps of:
determining a first interface on a first node of the contiguous pair that is connected to a second interface on a second node of the contiguous pair for a given subnet;
and
selecting a relevant VLAN between the first and second nodes of the contiguous pair based on the first and second interfaces; and
gathering current spanning tree information for the relevant VLAN.

13. (Currently Amended) The computer-readable medium as recited in Claim 12, wherein selecting a relevant VLAN between the first and second nodes of the contiguous pair comprises the steps of:
selecting a matching native VLAN of the first and second nodes of the contiguous pair as the relevant VLAN when the first interface and the second interface of the first and second nodes respectively of the contiguous pair are non-VLAN trunking interfaces;
selecting a matching active VLAN that is designated to carry traffic to a next hop as the relevant VLAN when the first interface and the second interface of the first and second nodes respectively of the contiguous pair are VLAN trunking interfaces; and
selecting a native VLAN that is on a non-VLAN trunking interface as the relevant VLAN when one of the first and second nodes of the contiguous pair has the non-VLAN trunking interface.

14. (Currently Amended) The computer-readable medium as recited in Claim 11, wherein determining a subpath for each contiguous pair of Layer 3 devices further comprises the steps of:

4 tracing a first path segment from a first node of the contiguous pair by following a
5 spanning tree associated with a relevant VLAN for the contiguous pair to a
6 root of the spanning tree;
7 tracing a second path segment from a second node of the contiguous pair by following
8 the spanning tree associated with the relevant VLAN for the contiguous pair to
9 the root of the spanning tree; and
10 concatenating the first and second path segments to result in creating and storing the
11 subpath for the contiguous pair.

1 15. (Original) The computer-readable medium as recited in Claim 14, wherein
2 concatenating the first path segment and the second path segment to result in creating
3 and storing the subpath for the contiguous pair includes the step of eliminating
4 extraneous devices from the first and second path segments.

1 16. (Original) The computer-readable medium as recited in Claim 11, wherein
2 concatenating the subpaths to result in creating and storing information representing
3 the Layer 2 path includes the step of eliminating extraneous devices from the
4 subpaths.

1 17. (~~Currently Amended~~) A computer-readable medium carrying one or more sequences
2 of one or more instructions for determining a Layer 2 path between a source ~~node~~
3 device and a destination ~~node~~ device in a switched network, the one or more
4 sequences of one or more instructions including instructions which, when executed by
5 one or more processors, cause the one or more processors to perform the steps of:
6 determining a Layer 3 path between the source device and the destination device,
7 wherein the Layer 3 path comprises information identifying two or more Layer
8 3 devices;
9 identifying contiguous pairs of Layer 3 devices in the Layer 3 path;
10 determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
11 determining whether any contiguous pair of Layer 3 devices has no subpath;

12 concluding that there is no Layer 2 path when any contiguous pair of Layer 3 devices
13 has no subpath;
14 eliminating extraneous devices in the subpaths; and
15 concatenating the subpaths to result in creating and storing information representing
16 the Layer 2 path when each of the contiguous pairs of Layer 3 devices has a
17 subpath.

- 1 18. (Currently Amended) The computer-readable medium as recited in Claim 17, wherein
2 determining a subpath for each contiguous pair of Layer 3 devices comprises the steps
3 of:
4 determining a first interface on a first node of the contiguous pair that is connected to
5 a second interface on a second node of the contiguous pair for a given subnet
6 when both the first node of the contiguous pair and the second node of the
7 contiguous pair have non-trunking interfaces;
8 determining a first native VLAN of the first interface and a second native VLAN the
9 second interface;
10 determining whether the first native VLAN matches the second native VLAN;
11 selecting the matching VLAN as a relevant VLAN between the first and second nodes
12 of the contiguous pair when the first native VLAN matches the second native
13 VLAN;
14 gathering a current spanning tree information for the relevant VLAN;
15 tracing a first path segment from the first node of the contiguous pair to a root of the
16 spanning tree by following the current spanning tree information associated
17 with the relevant VLAN to ~~[[a]]~~ the root of the spanning tree;
18 tracing a second path segment from the second node of the contiguous pair to the root
19 of the spanning tree by following the current spanning tree information
20 associated with the relevant VLAN;
21 eliminating extraneous devices in the first and second path segments; and
22 concatenating the first path segment and the second path segment to result in creating
23 and storing the subpath for the contiguous pair.

1 19. (Currently Amended) The computer-readable medium as recited in Claim 17, wherein
2 determining a subpath for each contiguous pair of Layer 3 devices comprises the steps
3 of:
4 determining a non-trunking node of the contiguous pair when one of the nodes of the
5 contiguous pair for a given subnet has a non-trunking interface and the other
6 node of the contiguous pair has a trunking interface;
7 determining the non-trunking interface on the non-trunking node of the contiguous
8 pair as a first interface that is connected to a second interface on the other node
9 of the contiguous pair;
10 determining a native VLAN on the first interface;
11 determining whether there is an active VLAN on the second interface that matches the
12 native VLAN on the first interface;
13 selecting the matching VLAN as a relevant VLAN between the non-trunking node and
14 the other node of the contiguous pair when there is an active VLAN on the
15 second interface that matches the native VLAN on the first interface;
16 gathering a current spanning tree information for the relevant VLAN;
17 tracing a first path segment from the non-trunking node of the contiguous pair to a root
18 of the spanning tree by following the current spanning tree information
19 associated with the relevant VLAN to the root of the spanning tree;
20 tracing a second path segment from the other node of the contiguous pair to the root of
21 the spanning tree by following the current spanning tree information associated
22 with the relevant VLAN;
23 eliminating extraneous devices in the first and second path segments; and
24 concatenating the first path segment and the second path segment to result in creating
25 and storing the subpath for the contiguous pair.

1 20. (Currently Amended) The computer-readable medium as recited in Claim 17, wherein
2 determining a subpath for each contiguous pair of Layer 3 devices comprises the steps
3 of:
4 determining a first interface on a first node of the contiguous pair that is connected to
5 a second interface on a second node of the contiguous pair for a given subnet

6 when both the first node of the contiguous pair and the second node of the
7 contiguous pair have non-trunking interfaces; and
8 determining a first active VLAN of the first interface associated with the given subnet
9 and a second active VLAN the second interface associated with the given
10 subnet;
11 determining whether the first active VLAN matches the second active VLAN;
12 selecting the matching VLAN as a relevant VLAN between the first and second nodes
13 of the contiguous pair when the first active VLAN matches the second active
14 VLAN;
15 gathering a current spanning tree information for the relevant VLAN;
16 tracing a first path segment from the first node of the contiguous pair to a root of the
17 spanning tree by following the current spanning tree information associated
18 with the relevant VLAN to the root of the spanning tree;
19 tracing a second path segment from the second node of the contiguous pair to the root
20 of the spanning tree by following the current spanning tree information
21 associated with the relevant VLAN;
22 eliminating extraneous devices in the first and second path segments; and
23 concatenating the first path segment and the second path segment to result in creating
24 and storing the subpath for the contiguous pair.

- 1 21. ~~(Currently Amended)~~ A computer data signal embodied in a carrier wave, the
2 computer data signal carrying one or more sequences of instructions for determining a
3 Layer 2 path between a source ~~node~~ device and a destination ~~node~~ device in a
4 switched network, wherein execution of the one or more sequences of instructions by
5 one or more processors causes the one or more processors to perform the steps of:
6 determining a Layer 3 path between the source device and the destination device,
7 wherein the Layer 3 path comprises information identifying two or more Layer
8 3 devices;
9 determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
10 and
11 concatenating the subpaths to result in creating and storing information representing
12 the Layer 2 path.

1 22. (Currently Amended) A computer apparatus comprising:
2 a processor; and
3 a memory coupled to the processor, the memory containing one or more sequences of
4 instructions for determining a Layer 2 path between a source ~~node~~ device and a
5 destination ~~node~~ device in a switched network, wherein execution of the one or
6 more sequences of instructions by the processor causes the processor to
7 perform the steps of:
8 determining a Layer 3 path between the source device and the destination device,
9 wherein the Layer 3 path comprises information identifying two or more Layer
10 3 devices;
11 determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
12 and
13 concatenating the subpaths to result in creating and storing information representing
14 the Layer 2 path.

1 23. (Currently Amended) A computer data signal embodied in a carrier wave, the
2 computer data signal carrying one or more sequences of instructions for determining a
3 Layer 2 path between a source ~~node~~ device and a destination ~~node~~ device in a
4 switched network, wherein execution of the one or more sequences of instructions by
5 one or more processors causes the one or more processors to perform the steps of:
6 determining a Layer 3 path between the source device and the destination device,
7 wherein the Layer 3 path comprises information identifying two or more Layer
8 3 devices;
9 identifying contiguous pairs of Layer 3 devices in the Layer 3 path;
10 determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
11 determining whether any contiguous pair of Layer 3 devices has no subpath;
12 concluding that there is no Layer 2 path when any contiguous pair of Layer 3 devices
13 has no subpath;
14 eliminating extraneous devices in the subpaths; and

concatenating the subpaths to result in creating and storing information representing the Layer 2 path when each of the contiguous pairs of Layer 3 devices has a subpath.

24. (Currently Amended) A network device that can determine a Layer 2 path between a source ~~node~~ device and a destination ~~node~~ device in a switched network comprising:
a network interface;
a processor coupled to the network interface and receiving information from the network interface; and
a computer-readable medium accessible by the processor and comprising one or more sequences of instructions which, when executed by the processor, cause the processor to carry out the steps of:
determining a Layer 3 path between the source device and the destination device, wherein the Layer 3 path comprises information identifying two or more Layer 3 devices;
identifying contiguous pairs of Layer 3 devices in the Layer 3 path;
determining a subpath for each contiguous pair of Layer 3 devices in the Layer 3 path;
determining whether any contiguous pair of Layer 3 devices has no subpath;
concluding that there is no Layer 2 path when any contiguous pair of Layer 3 devices has no subpath;
eliminating extraneous devices in the subpaths; and
concatenating the subpaths to result in creating and storing information representing the Layer 2 path when each of the contiguous pairs of Layer 3 devices has a subpath.

25. (Currently Amended) A system for determining a Layer 2 path between a source ~~node~~ device and a destination ~~node~~ device in a switched network, the system comprising:
means for determining a Layer 3 path between the source device and the destination device, wherein the Layer 3 path comprises information identifying two or more Layer 3 devices;
means for identifying contiguous pairs of Layer 3 devices in the Layer 3 path;

7 means for determining a subpath for each contiguous pair of Layer 3 devices in the
8 Layer 3 path;
9 means for determining whether any contiguous pair of Layer 3 devices has no subpath;
10 means for concluding that there is no Layer 2 path when any contiguous pair of Layer
11 3 devices has no subpath;
12 means for eliminating extraneous devices in the subpaths; and
13 means for concatenating the subpaths to result in creating and storing information
14 representing the Layer 2 path when each of the contiguous pairs of Layer 3
15 devices has a subpath.

- 1 26. ~~(New)~~ A method of determining a Layer 2 path between a source device and a
2 destination device in a switched network, the method comprising the computer-
3 implemented steps of:
4 means for determining a Layer 3 path between the source device and the destination
5 device, wherein the Layer 3 path comprises information identifying two or
6 more Layer 3 devices;
7 means for determining a subpath for each contiguous pair of Layer 3 devices in the
8 Layer 3 path; and
9 means for concatenating the subpaths to result in creating and storing information
10 representing the Layer 2 path.
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